

Self-cleaning, Superhydrophobic Cotton Fabrics with Excellent
Washing Durability, Solvent Resistance and Chemical Stability
Prepared from SU-8 Derived Surface Coating

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Electronic Supplementary Information

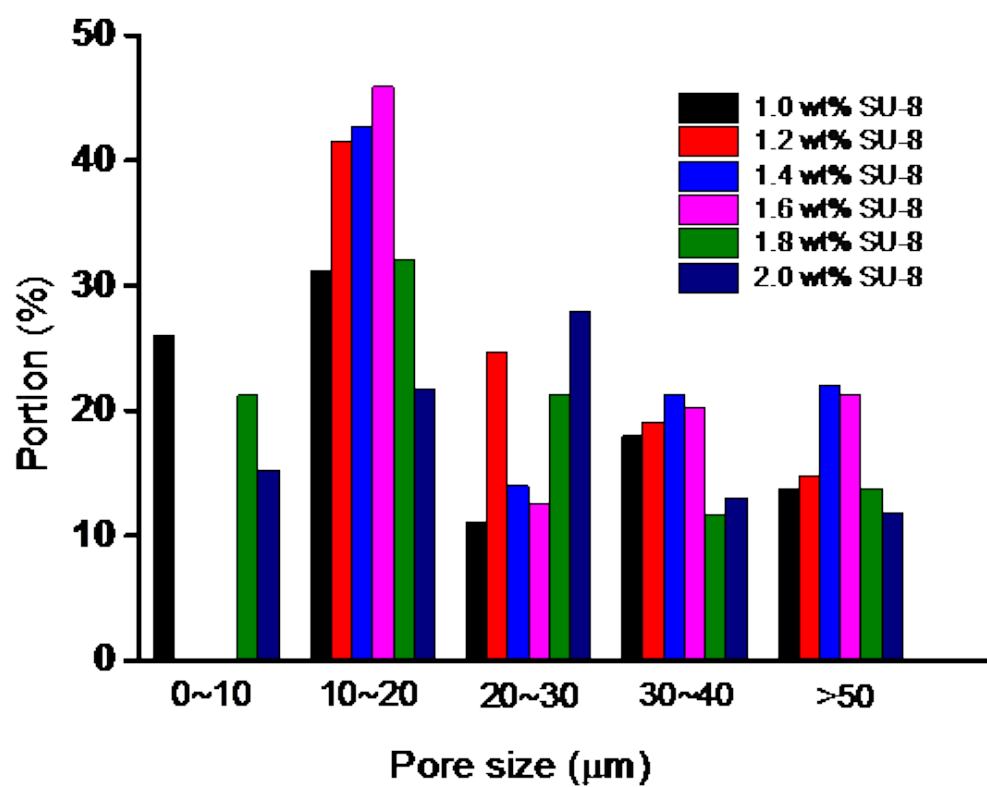


Fig. S1 Histogram of pore size distribution for cotton fabric after coating with SU-8 solution of different contents.

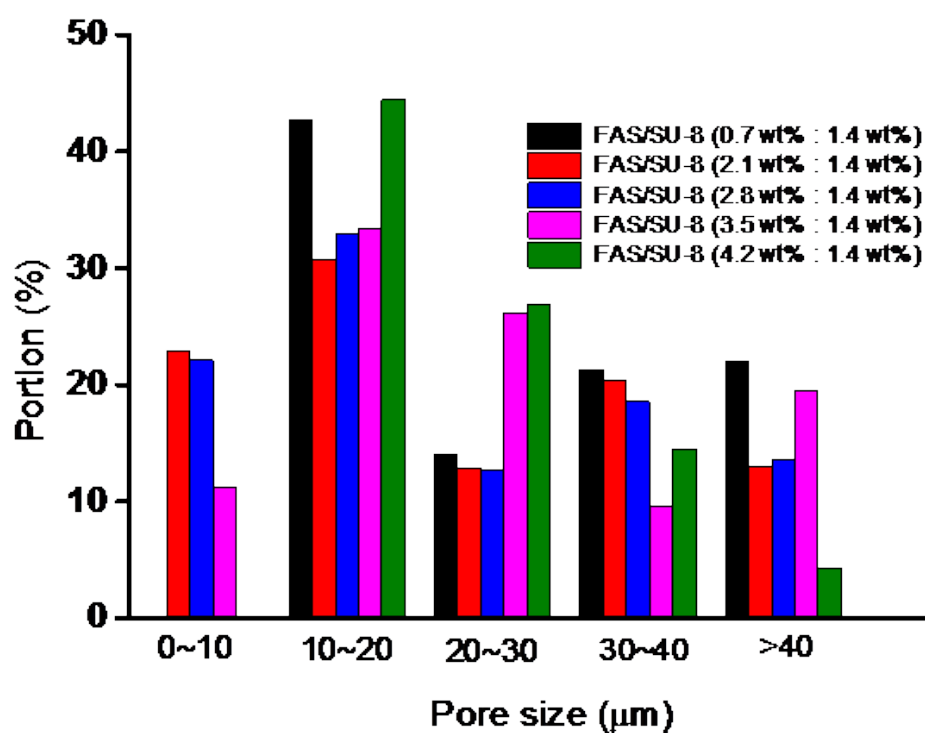


Fig. S2 Histogram of pore size distribution for cotton fabric treated with SU-8/FAS solution containing 1.4 wt% SU-8 and different concentrations of FAS.

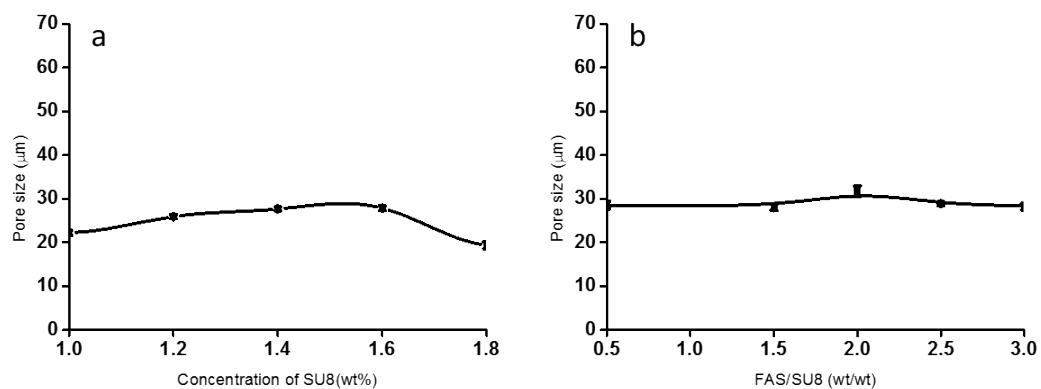


Fig. S3 Pore size changes with (a) SU-8 content (in SU-8 solution) (b) FAS content (in 1.4 wt% SU-8 solution).

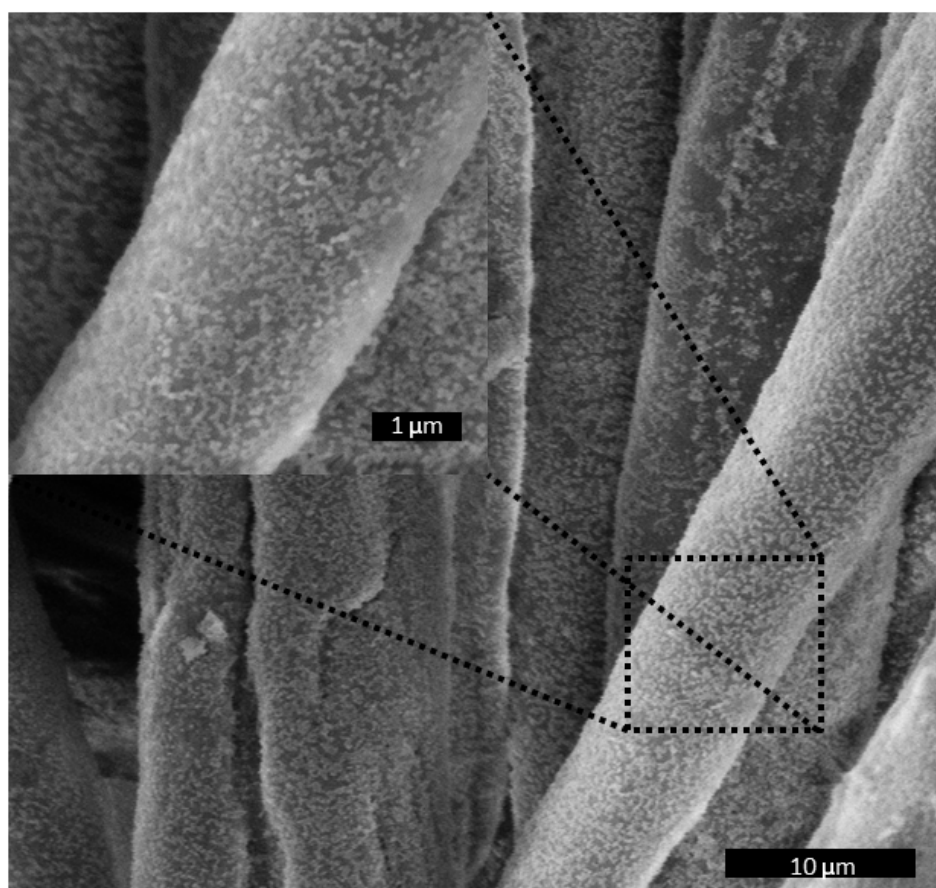


Fig. S4 SEM images of the SU-8/FAS/Silica nanoparticles coated cotton fabric. (SU-8 1.4 wt%, FAS 2.8 wt%, and Silica nanoparticles 1.0 wt%)

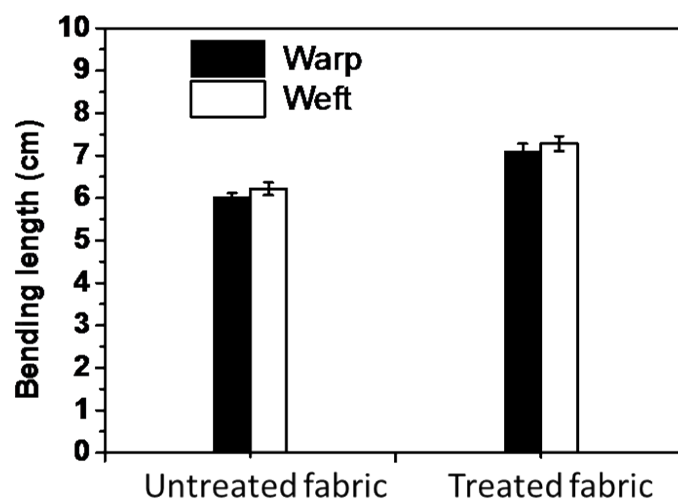


Fig. S5 Bending length of the cotton fabric before and after the superhydrophobic coating treatment.

The fabric rigidity was tested by the cantilever method using a M003B Shirley stiffness tester (BS 3356 BS 9073 part 7 and ASTM D1388). As shown in Fig. S5, the bending length only increased slightly in both warp and weft directions after the coating treatment. The bending length is an indication of the fabric handle property. The higher the bending length, the more rigid the fabric is, and the fabric is less comfortable to wearers. The small difference in the bending length indicates that the superhydrophobic coating had a small influence on the fabric handle.

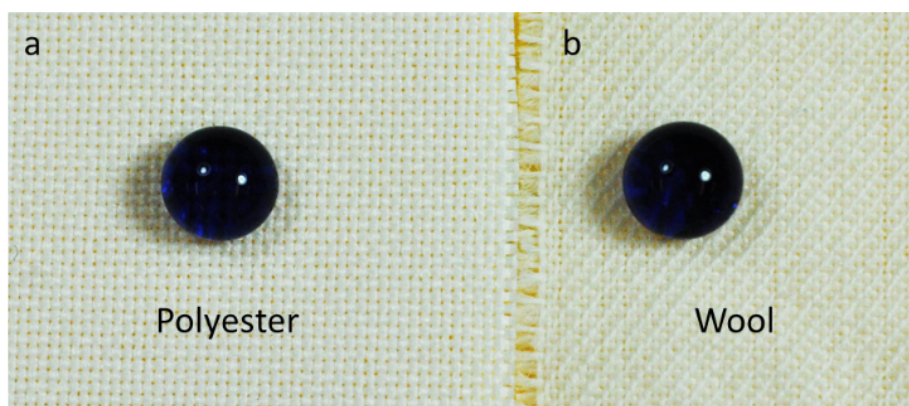


Fig. S6 Blue-dyed water drops on the SU-8/nanoparticle/FAS coated (a) polyester and (b) wool fabrics.

Polyester and wool fabrics were treated by the SU-8/nanoparticle/FAS coating. Both the fabrics turned superhydrophobic after the coating treatment. The treated fabrics had a CA higher than 167° and SA as small as 2° .

Table S1. Elemental composition of the cotton fabric before and after coating treatment

	Atomic Content (%)			
	C	O	Si	F
Pure cotton	60.21	39.79	0	0
SU-8/FAS/Silica particles	29.52	18.52	8.12	43.84

Table S2. Contact angle of the coated fabrics after immersion in different solvents for different periods of time

Solvent Time (h)	Ethanol	DMF	Acetone	Ethyl acetate	2-Butanone
0	165.68±1.61	165.68±1.61	165.68±1.61	165.68±1.61	165.68±1.61
3	166.44±1.68	165.5±1.76	166.05±1.68	162.06±2.07	162.64±1.48
6	163.32±1.61	167.15±1.85	165.41±2.34	165.48±1.95	164.98±2.21
9	164.21±0.69	164.21±1.7	164.04±0.96	164.73±0.93	165.26±1.04
18	164.99±1.86	162.62±1.37	163.1±0.77	162.94±1.06	162.55±1.88
24	162.97±2.33	163.66±2.65	162.88±0.75	162.95±0.89	162.74±1.01
48	164.21±1.27	163.41±1.21	163.5±1.35	162.97±1.38	163.89±1.21
72	163.71±0.84	163.72±1.63	163.74±1.47	162.16±1.02	162.6±1.41
96	162.59±1.51	161.99±0.53	164.08±1.13	163±1.42	163.15±0.84

Table S3. Sliding angle of the coated fabrics after immersion in different solvents for different periods of time

Time (h) \ Solvent	Ethanol	DMF	Acetone	Ethyl acetate	2-Butanone
0	1.96±0.11	1.96±0.11	1.96±0.11	1.96±0.11	1.96±0.11
3	1.85±0.13	1.83±0.21	1.85±0.06	1.95±0.06	1.83±0.1
6	1.78±0.13	1.9±0.16	1.88±0.1	1.9±0.08	1.88±0.13
9	1.93±0.13	1.78±0.1	1.88±0.1	1.9±0.08	1.85±0.06
18	1.85±0.21	1.83±0.05	1.9±0.08	1.93±0.05	1.83±0.05
24	1.83±0.15	1.88±0.19	1.85±0.13	1.93±0.1	1.83±0.1
48	1.85±0.1	1.9±0.08	1.9±0.08	1.88±0.13	1.85±0.06
72	1.93±0.13	1.88±0.21	1.88±0.21	1.85±0.06	1.9±0.14
96	1.9±0.08	1.85±0.21	1.88±0.05	1.88±0.13	1.88±0.1

Table S4. Contact angle of the coated fabrics after immersion in different pH solutions for different periods of time

Solvent Time (h)	pH=1	pH=2	pH=4	pH=7	pH=10	pH=12	pH=14
0	165.68±1.61	165.68±1.61	165.68±1.61	165.68±1.61	165.68±1.61	165.68±1.61	165.68±1.61
3	162.21±1.17	162.49±1.16	162.4±0.52	161.81±1.52	162.09±0.75	164.29±1.49	164.48±1.33
6	162.58±0.47	161.15±1.12	162.86±1.18	162.93±1.84	163.15±0.7	162.31±0.97	163.36±0.42
9	160.96±0.74	163.72±1.43	163.21±0.89	160.82±0.9	163.85±1.22	165.05±1.56	163.53±0.7
18	163.96±0.52	163.15±1.33	160.56±1.11	164.08±1.44	163.61±0.98	163.88±1.42	162.24±0.75
24	163.62±1.63	163.57±1.46	162.24±0.84	163.56±0.86	163.22±0.91	161.67±0.6	161.95±0.58
48	161.39±0.79	162.37±1.02	162.05±0.95	163.45±0.63	161.49±0.52	161.85±0.89	162.24±0.51
72	161.21±0.42	162.59±0.87	163.76±1.64	161.35±1.22	162.32±1.01	163.21±1.36	165.49±1.89
96	162.54±1.47	161.76±1.13	164.71±0.96	161.2±0.55	163.1±0.7	163.85±1.11	162.84±1.16

Table S5. Sliding angle of the coated fabrics after immersion in different pH solutions for different periods of time

Solvent Time (h)	pH=1	pH=2	pH=4	pH=7	pH=10	pH=12	pH=14
0	1.96±0.11	1.96±0.11	1.96±0.11	1.96±0.11	1.96±0.11	1.96±0.11	1.96±0.11
3	1.89±0.08	1.95±0.06	1.9±0.08	1.9±0.14	1.83±0.1	1.78±0.1	1.92±0.09
6	1.91±0.18	1.98±0.1	1.83±0.1	1.83±0.1	1.9±0.08	1.88±0.13	1.97±0.18
9	1.88±0.1	1.95±0.06	1.93±0.13	1.83±0.22	1.88±0.1	1.80±0	2.00±0.22
18	1.93±0.08	1.9±0.14	1.85±0.06	1.8±0.08	1.85±0.06	1.9±0.08	1.98±0.15
24	1.85±0.19	1.9±0.08	1.88±0.05	1.85±0.24	1.85±0.1	1.83±0.13	1.96±0.2
48	1.97±0.14	1.8±0.18	1.9±0.08	1.85±0.13	1.85±0.13	1.85±0.13	1.9±0.19
72	1.99±0.23	1.83±0.15	1.88±0.05	1.78±0.05	1.85±0.1	1.85±0.13	1.89±0.24
96	1.88±0.17	1.88±0.17	1.83±0.15	1.8±0.12	1.85±0.21	1.88±0.21	1.92±0.16